SEC. CL.	ORIGIN	CONTROL NO.
U	TDS/DS [redacted]	TDS/D-742-67

DATE OF DOC	DATE REC'D	DATE OUT	SUSPENSE DATE	CROSS REFERENCE OR POINT OF FILING
13 Mar 67		14 Mar 67		

TO MEMORANDUM FOR THE RECORD

FROM [redacted]

SUBJ. Proposal for Conducting Evaluation of SO-239 Film

ORIG: [redacted]

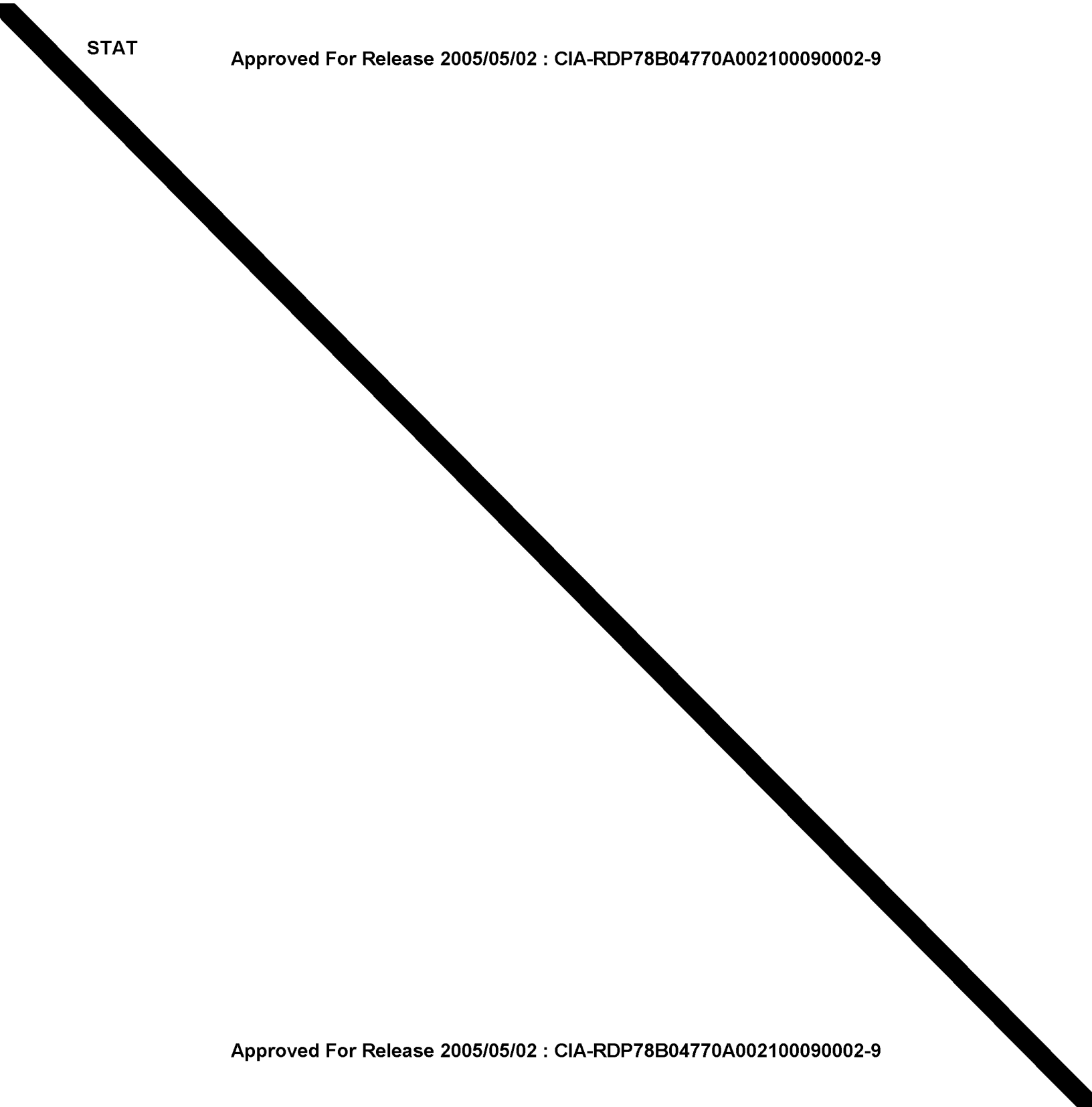
ROUTING	DATE SENT
C/DS	14 Mar
DA/TD	[illegible]
A/TD	

[redacted]

Declass Review by NGA.

COURIER NO.	ANSWERED	NO REPLY

3



NPIC/TDS/D-742-67
13 March 1967

MEMORANDUM FOR THE RECORD

STAT SUBJECT: [redacted] Proposal for Conducting Evaluation of SO-239 Film

1. The Direct Duplicating Aerial Film, Type SO-239 may in time prove to be a very valuable film, however, at present its usefulness is limited by its very slow speed. The Navy Department (NRTSC) has attempted to use this film in their Gamma I Rectifier Program with little success because of its low sensitivity. They are now involved in conducting tests on the NPIC's Reversal Processor RT-12 as a means of meeting their requirements.

2. Attached as enclosure No. 1 are NRTSC reports of tests or evaluation of the SO-239 film.

STAT 3. [redacted] makes a practice of releasing technical data on their aerial films and it is safe to assume that this film will be no exception when the data becomes available; attached as enclosure No. 2 is a copy of one such data sheet.

4. It is my recommendation that the proposal not be given favorable consideration for the following reasons:

a. The material will undoubtly be improved in the near future, when more extensive tests may well be in order.

b. Most of the data proposed by the evaluation can soon be expected to become available [redacted] Data Sheet) at no cost to the Government.

c. Present NPIC requirements for duplicating film in the reversal mode can be met by reversal processing in RT-12 using 8430 duplicating film which is much more sensitive than the SO-239.

[redacted]

WORK ORDER PROGRAM 3106667

TESTING OF

STAT [redacted]0-239

DIRECT DUPLICATING FILM

PREFORMED AT NRTSC PHOTOLAB

[redacted]

Incl (1)

Approved For Release 2005/05/02 : CIA-RDP78B04770A002100090002-9

INTRODUCTION

Tests were run at the NRTSC photo lab to determine the feasibility of using SO-239 Direct Duplicating Film to reduce the time and expense of making dupe posatives and negatives, by eliminating an intermediate printing and processing step.

The SO-239 had to meet the requirements for tone reproduction ie; gamma latitude and required maximum densities, as well as work in present machine processers in chemistry currently being used by this command lab.

With the afore thoughts in mind the following tests were run, and conclusions dwawn.

OBJECTIVE TESTING

A sensistrip was exposed in the sensitometer at 3.677 Log meter candle seconds. It was processed in the Versamat at 10 FPM The resultant strip plotted out with a 1.03 gamma and a Max density of 1.58.
See fig 1

A second strip was exposed at 3.677 Log meter candle seconds, and processed at 5 FPM. The result had a gamma of 1.35 with a Max density of 2.14.
See fig 2

OBJECTIVE CONCLUSIONS

The curves show good tone spperation and response. The gamma latitude is adequate for most tone reproduction, however, this latitude would not encompase any extreme variations in the contrast of the original.

The extreme low sensitivity of the SO-239 may cause some complications in the printing of over exposed original materials on printers such as the 9.5 Niagara of the 6.6 Concord.

SUBJECTIVE TESTING

An original posative was printed on a [redacted] contact printer. The film was processed at 5 FPM for a gamma of 1.35.
See fig 3

An original negative was also printed, but was processed at 10 FPM for a gamma of 1.03.
See fig 4

OBJECTIVE CONCLUSIONS

The resulting dupe have a slight brownish tone that is somewhat like a sepea tone, when compared to the original. It is felt that this tone difference is not objectionable and does not detract from the photographic quality of the dupe.

The densities in the dupes are in equal proportions to the densities in the originals. There is no apparent loss of detail and the dupes are clear and crisp.

14 cl.
0

55-0

2-4-67
0200

1.65

	1.06	
.12	1.27	.21
.17 .02	1.45	.18
.17 .03	1.63	.18
.22 .05	1.81	.18
.28 .06	1.96	.15
.36 .08	2.06	.10
.45 .09	2.15	.06
.56 .11	2.19	.04
.73 .17	2.21	.02
.88 .15		
.18		

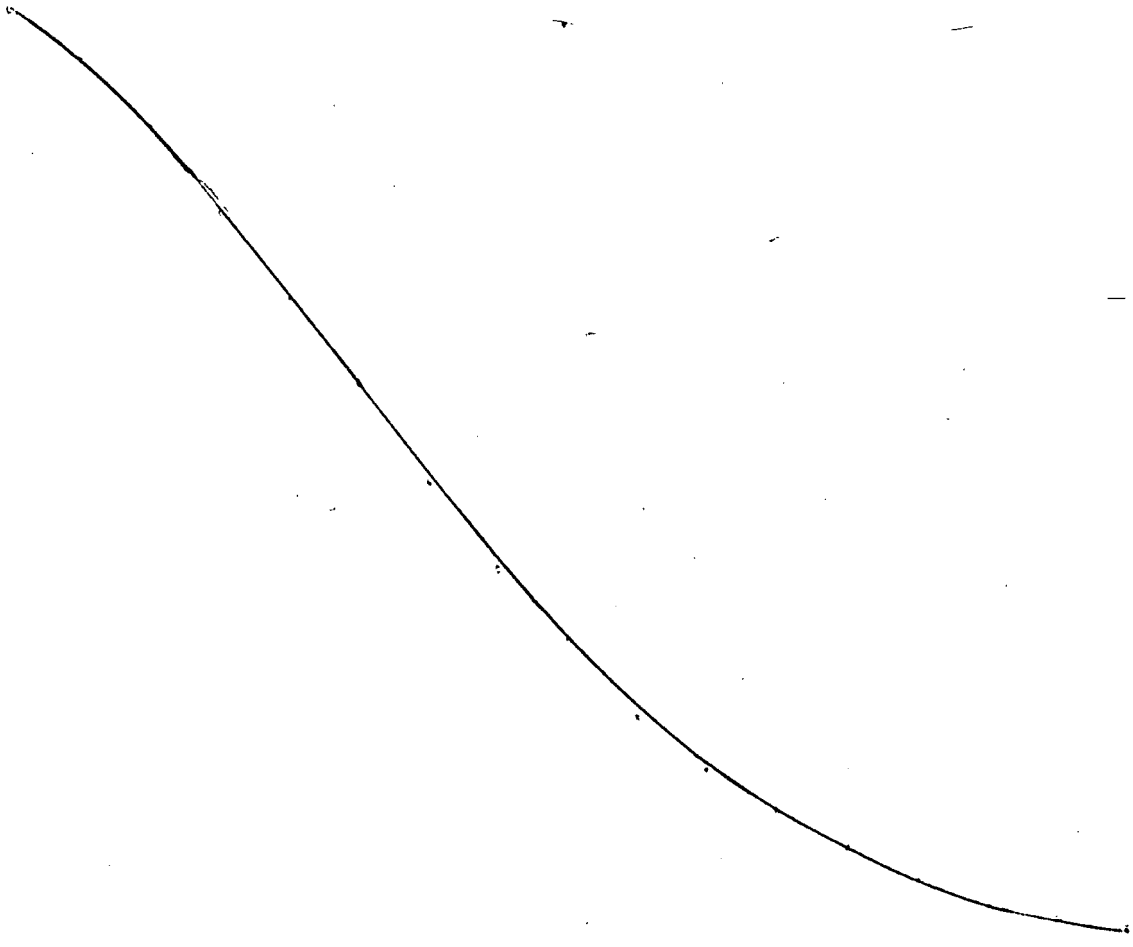


Fig 1

14 cl.
0

2-4-67
0345
cw.

85-0
5" FPM. 2 Rack (14 DW.)

1.32

	1.58
.19	1.80
.25	2.00
.32	2.12
.39	2.20
.47	2.26
.60	2.28
.80	2.34
1.00	2.37
1.19	2.38
1.40	

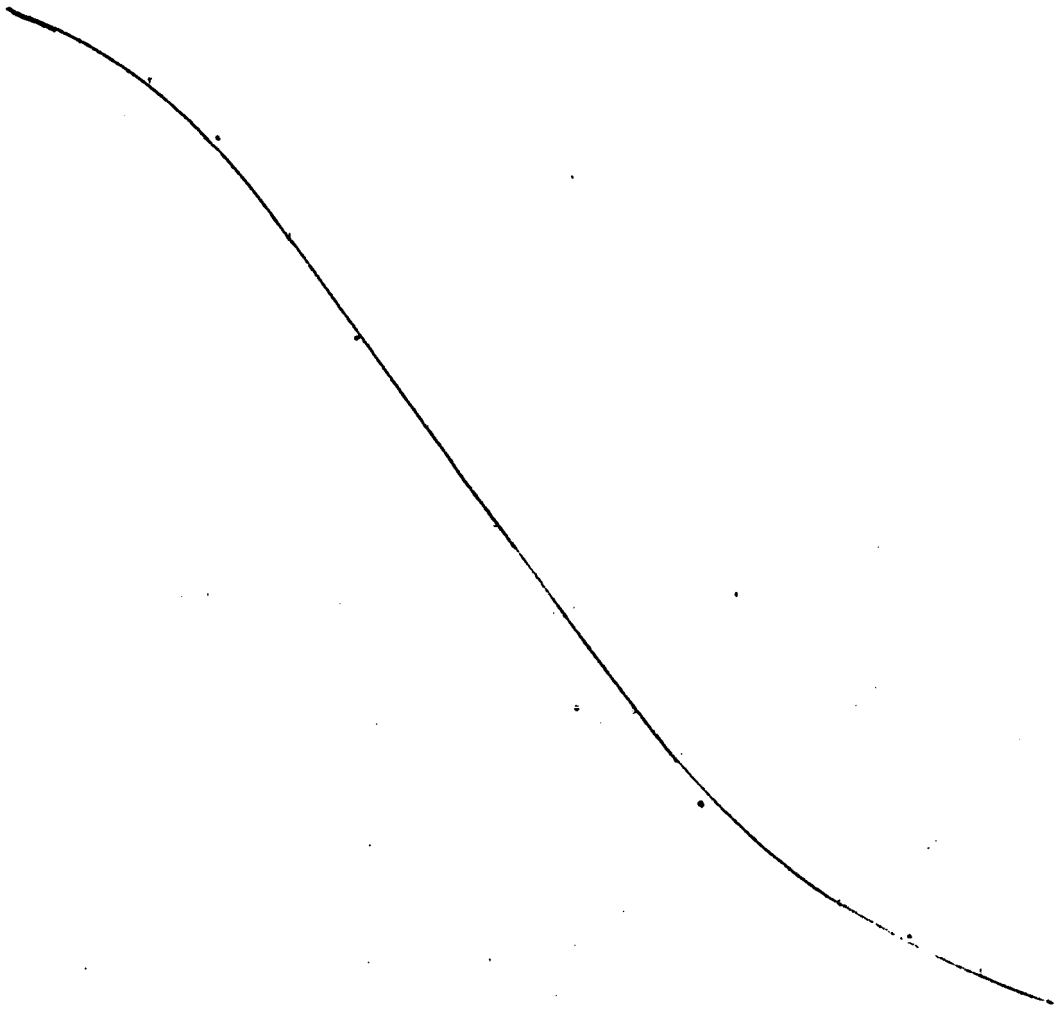


Fig 2-

PROCESSING SPECIFICATIONS

TAT Processor [redacted] model 11B Versamat

Chemistries MX 578 (1¼ DN) Developer replenisher

TAT [redacted] Type 'A' Fix

TAT Sensitometer [redacted] model 101

The chemistry in the Versamat was set at 85 degrees F. The dryer settings were 125 degrees F with both damper settings at 2.

The two developer tanks were half filled with MX 578 developer replenisher. 22 oz Versamat Type 'A' Starter was added and the ta nks topped off with developer replenisher.

The developer level was set at the following

pH	9.84
Spec Grav	1.096

The replenishment rate was set at 500cc for both chemistries.

All testing was preformed with the '2 rack' technique.

Emulsion SO-239

EXPOSURE

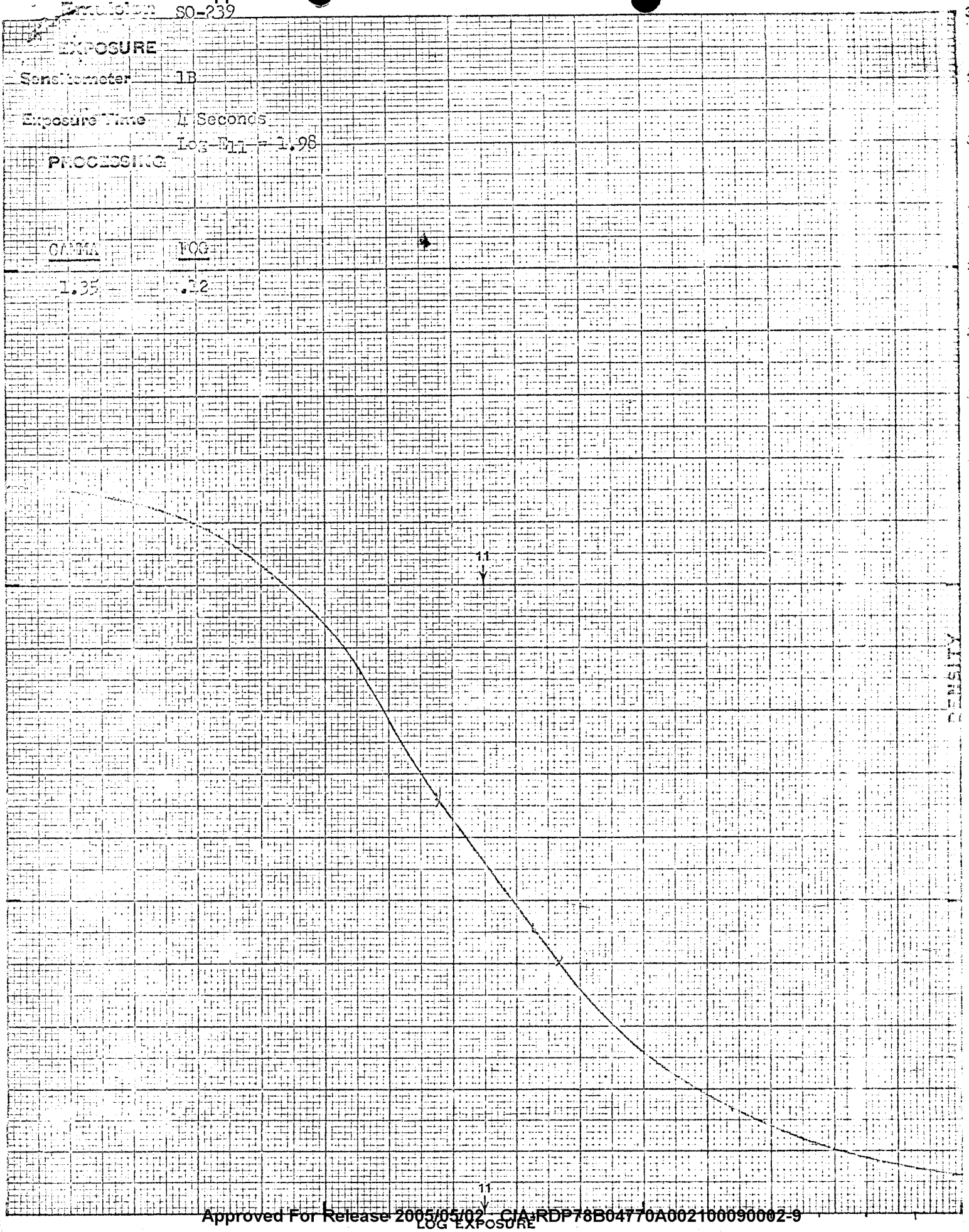
Sensitometer 1B

Exposure Time 4 Seconds

Log E_{11} = 1.98

PROCESSING

GAMMA	FOG
1.35	.22



SUGGESTED PROCESSING CONDITIONS

MACHINE Versamat
EMULSION TYPE SO-239
FILM TYPE Direct Dupe
FILM SIZE 70mm
PROC. EMUL. UP X DOWN ___

MACHINE SPEED DIAL SETTING 8
FILM STRIP SPEED 8 ft./min.
SECONDS PER RACK 30
NO. OF DEV. RACKS 2

PROCESSING STAGE	CHEMICAL TANK	CHEMICAL REPL	REPL RATE (PER MIN)	TEMP °F	TIME	NO. R	AGITATION	COMMENTS
Developer	*14DN	14DN	500mls	85 ± 1	60"	2	Roller Action	*Add 24 oz. of Type A Starter to a fresh machine tank of developer.
Fixer	Type A	Type A	485 mls	77 ± 2	1'30"	3	Roller Action	
Wash	Water	Water	7 gal	77 ± 2	60"	2	Cascading	
Dryer				125 ± 5				

DAMPER SETTINGS:

INTAKE 2

EXHAUST 2

SUMMARY

If the requirement for direct duplication, either negative or positive is enough to justify the expense of purchasing and storage, this film will be a great benifit to the industry. It will save both time, and money as it will eliminate the necessity of making an intermediate negative or positive to arrive at the end product. This is a savings of both film and chemicals as well as time.

No tests were run to find the spectral sensitivity or resolution of the SO-239 Direct Duplicating Film.

All testing was conducted in total darkness.

Approved For Release 2005/05/02 : CIA-RDP78B04770A002100090002-9

TYPE No. SO-243
(March 1963)

[redacted] SPECIAL HIGH DEFINITION AERIAL FILM (Gray Base)

A high-altitude reconnaissance film with ultra-fine grain and high acutance

BASE: 5.25-mil triacetate without gel backing

SENSITIVITY: Panchromatic, with extended red sensitivity

RMS GRANULARITY: [redacted]

RESOLVING POWER: T.O.C. 1000:1 — 465 lines/mm (D-19); 525 lines/mm (D-76)
T.O.C. 1.6:1 — 205 lines/mm (D-19); 205 lines/mm (D-76)

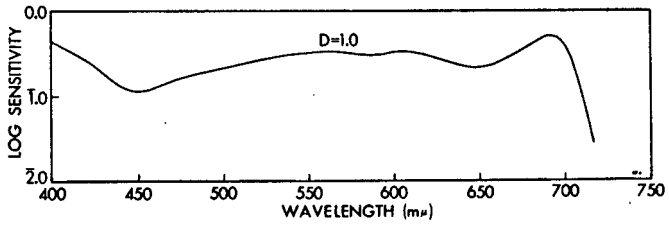
SAFELIGHT: *Total darkness required.* A KODAK Safelight Filter, WRATTEN Series 3 (dark green), in a suitable safelight lamp with a 15-watt bulb can be used at not less than 4 feet for *only* a few seconds after development is half completed.

EXPOSURE INDEX: Daylight—**1.6**
(Based on normal development of 8 minutes at 68 F in D-19)

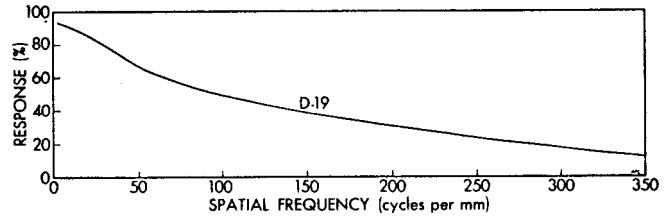
FILTER FACTORS:

WRATTEN Filter	No. 12	No. 25
Factor	**2.0**	**2.5**

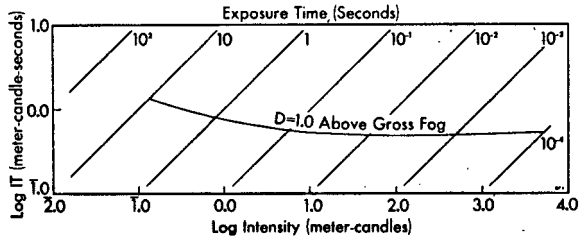
SPECTRAL SENSITIVITY D-19 D = 1.0 above gross fog



MODULATION TRANSFER CURVE (Formerly SINE-WAVE RESPONSE)



RECIPROCITY CHARACTERISTICS D-19 D = 1.0 above gross fog



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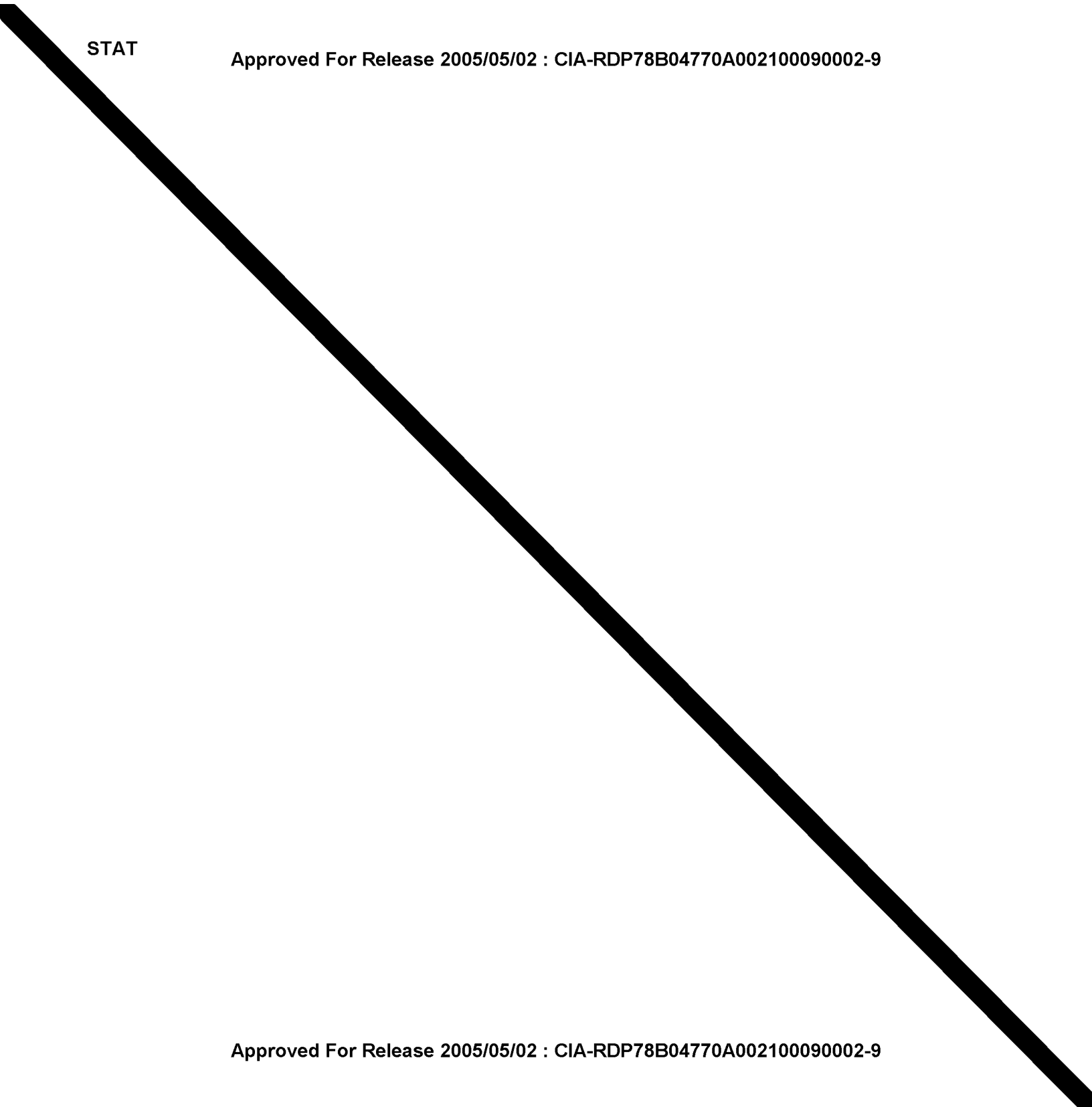

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